ObuKHOV, A. I.

821,10

S/056/60/038/03/08/033 B006/B014

24.6600 AUTHORS:

Perfilov, N. A., Darovskikh, V. F., Denisenko, G. F.,

Obukhov, A. I.

TITLE:

Fission of Uranium Nuclei Induced by 9-Bev Protons

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,

Vol. 38, No. 3, pp. 716-718

TEXT: In the article under consideration, the authors bombarded nuclear emulsions of the type P-9Ch containing naturally-occurring uranium with 9-Bev protons on the proton synchrotron of the OIYaI. When evaluating the plates the authors selected only such events in which two tracks occurred in addition to the tracks of light-charged particles (usually protons or alpha particles); tracks of fission fragments induced by thermal neutrons corresponded to the blackening intensity of these. The range ratio of light and heavy fragments was $L_1/L_1 < 2$. The authors confined themselves to such cases in which a considerable fragmentation admixture was observable at $L_1/L_2 > 2$.

Altogether, 1,042 such stars were recorded. The fission cross section was

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Fission of Uranium Muclei Induced by 9-Bev Protons

S/056/60/038/03/08/055 B006/B014

calculated from the formula $\sigma_f = N_f/N_{\rm nucl}N_p$, where N_f denotes the number of fissions found per cm³, $N_{\rm nucl}$ the number of uranium nuclei per cm³, and N_f the proton flux. It was found that $\sigma_f = (1.3 \pm 0.4)$ barns. When 9-Bev protons interact with the nuclei of the emulsion secondaries with E < 9 Bev protons interact with the nuclei of the emulsion secondaries with E < 9 Bev protons interact with the nuclei of the cross section. This background is occur which make some contribution to the cross section. This background is considered to be ~30%, so that the true value of σ_f is likely to be considered to be ~30%, so that the true value of σ_f is likely to be considered to be a shows the distribution of the fission events, which were acceptable. Fig. 1 shows the distribution of the fragments of almost unity it follows that fissions with a mass ratio of the fragments of almost unity it follows that fissions with a mass ratio of the fragments of almost unity are the most probable. Fig. 2 shows the dependence of the sum of average range are the most probable. Fig. 2 shows the dependence of the sum of average range of the fragments on L_1/L_h . The distribution realishits three peaks. The results obtained by studying the angular distribution of the said fragments are also given. The ratio between the particle number in two angular ranges, N(0.300)/N(60.900) was 1.07 ± 0.11 , i.e., the distribution was isotropic

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Fission of Uranium Nuclei Induced by 9-Bev Protons

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within the statistical limits of error. The distribution of the fission events according to the number of the accompanying "black" prongs is illustrated in Fig. 3. It was found that $\bar{n}_{op} = 3.82$, while $\bar{n}_{p} = 1.16$ at 660 MeV. In conclusion, the authors thank the team of the laboratoriya vysokikh energiy OIYaI (High-energy Laboratory of the Joint Institute of Nuclear Research) for their assistance in carrying out the bombardment. There are 3 figures and 5 Soviet references.

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR (Radium Institute of the Academy of Sciences, USSR)

SUBMITTED: September 10, 1959

Card 3/3

OBUKHOV, A.I.; PERFILOV, N.A.

Anisotropy in the fission of bismuth and uranium irradiated by 660 Mev. protons. Zhur. eksp. i teor. fiz. 40 no.5:1250-1252 My '61. (MIRA 14:7)

1. Radiyevyy institut AN SSSR.
(Nuclear fission) (Protons)

EWT(m)/EPF(n)-2/EWP(t)/EWP(b)/EWA(h) Pu-L/Peb IJP(c) WW/JD/JG L 41868-65 ACCESSION NR AMSCO7591 BOOK EXPLOITATION Obukhov, A. I. Study of muclear fission asymmetry and anisotropy during irradiation of uranium and bismuth by high-energy protons (Izucheniye assimmetrii i anizotropii 2/ deleniya yader pri obluchenii urana i vizmuta protonami vysokikh energiy), Leningrad, 1963, 136 p. illus., biblio. (At head of title: Radiyevyy institut im. V. G. Khlopina AN SSSR). Unpublished dissertation submitted for the degree of candidate of physical and mathematical sciences. TOPIC TAGS: nuclear fission, spontaneous fission, fission products, uranium, bismuth, proton radiation TABLE OF CONTENTS [abridged]: Introduction -- 3 Introduction — 3 Ch. I. Literature review — 5 Ch. II. Experimental part and results — 52 Ch. III. Data analysis - 84 Ch. IV. Discussion of results - 94 Conclusions -- 116 Card 1/2

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BELYAYEV, L.M.; PRANTSIZOV, Ya.L.; OBUKHOV, A.I., nauchn. red.;
ZHUKAVLEV, B.A., red.

[Erecting freight and passenger suspended cableways]
Montazh gruzovykh i passazhirokikh podvesnykh kanatnykh dorog. Moskva, Stroiizdat, 1964. 250 p.

(MIRA 17:12)

21(7) AUTHOR:

Obukhov, A. I.

sov/56-35-4-38/52

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TITLE:

Determination of the Momentum and the Excitation Energy

Generated by a Heavy Nucleus in Interaction With a

Fast Proton (Opredeleniye impul'sa i energii vozbuzhdeniya,

poluchayemykh tyazhelym yadrom pri vzaimodeystvii yego s

bystrym protonom)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 4, pp 1042-1044 (USSR)

ABSTRACT:

The author experimentally determined the mean value of the longitudinal as well as of the vertical component of the nuclear momentum in the interaction of 660 MeV protons with uranium nuclei. For these investigations the author employed the photo-emulsions method. The angular distribution of fission fragments in the system of the fissioning nucleus is assumed to be isotropic in first approximation. The plate was irradiated by a proton beam vertical to its surface. A table supplies the values found for the components of the nuclear momentum, as well as theoretical values, which were calculated from the data on the angular- and energy distribution of cascade nucleons.

Card 1/2

sov/56-35-4-38/52

Determination of the Momentum and the Mcitation Energy Generated by a Heavy Nucleus in Interaction With a Fast Proton

This table shows the qualitative agreement between calculated and experimental results. The author thanks Professor N. A. Perfilov for some critical comments, and he expresses his gratitude to N. S. Ivanova and I. I. P'yanov, who made the calculated data concerning the angular- and energy distribution of uranium cascade nucleons available. There are 1 table and 7 references, 3 of which are Soviet.

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR

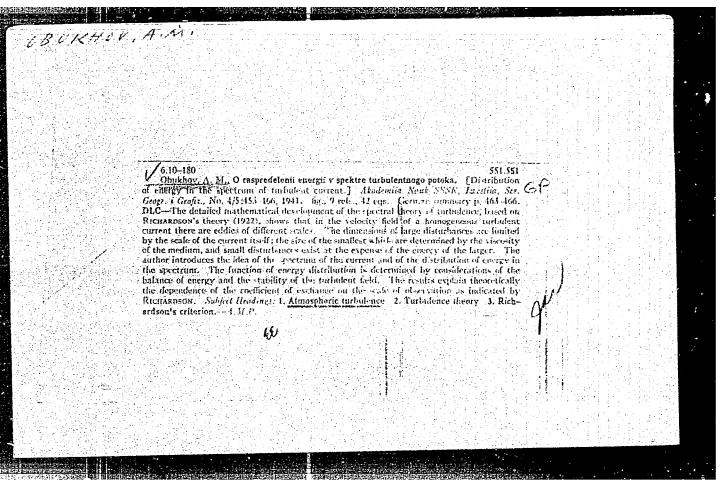
(Radium Institute of the Academy of Sciences USSR)

SUBMITTED: June 2, 1958

Card 2/2

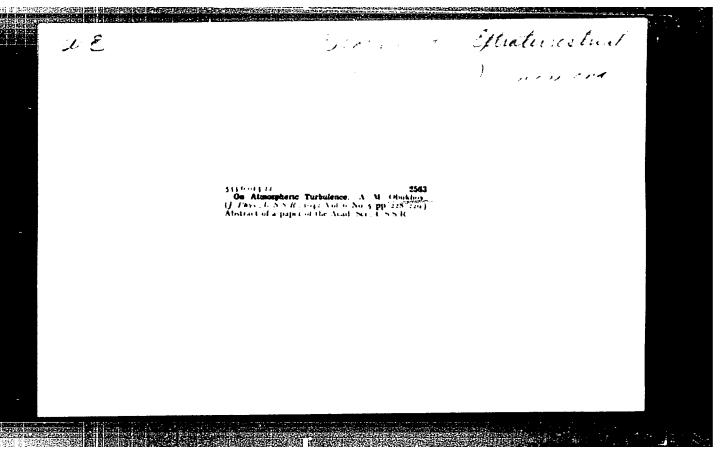
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| OBUKHOV, A. K. | |
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| Monthly List of Russian Accessions, Library of Congress, Pay 1953, Unclassif | ied. |

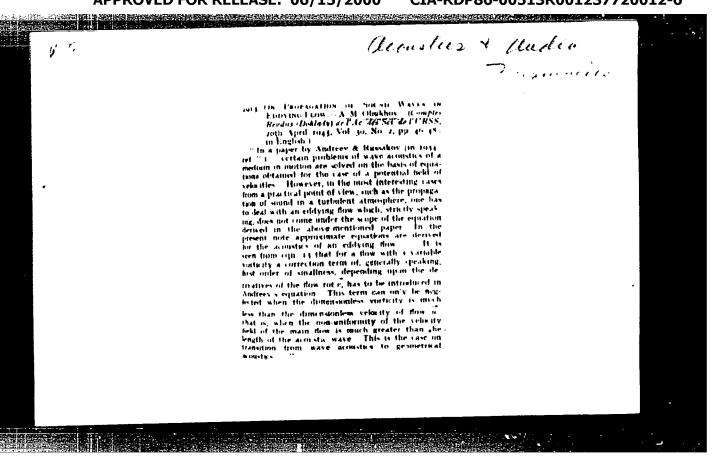
OBUKHOV, A.M. Normal'naya korrelyatsiya vektorov. IAN, SER. MATEM. 1938, 339-370. Teoriya korrelyatsii vektorov, M. uchen, zap, un-ta, 45 (1940), 73-92. O rasayanii zvuka v turbulentnom potoke. DAN, 30 (1941), 611, 611. O raspredelenii energii v spektre turbulentnogo potoka. DAN, 32 (1941), 22-24. SO: Mathematics in the USSR, 1917-1947 edited by Kurosh, A. G. Markushevich, A. I. Rashevskiy, P. K. Mosenw-Leningrad, 1948



OBUKHOV, A. M.

"Toward the Theory of Atmospheric Turbulence," Izvestiva an USSR, Physics Series, No 1-2, 1942, pages 59-64.



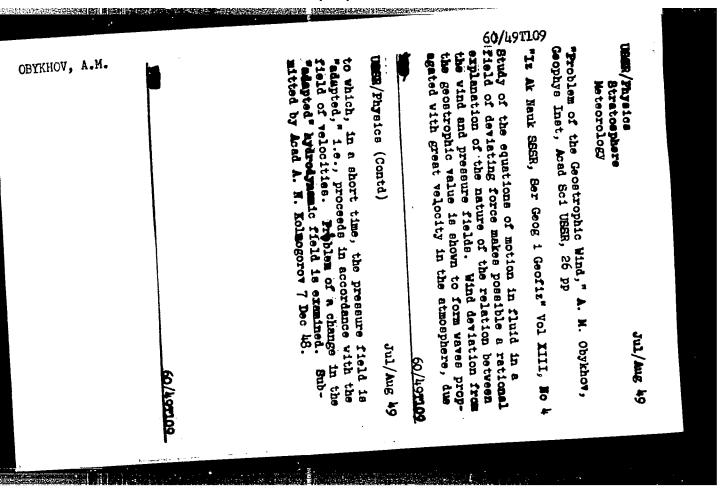


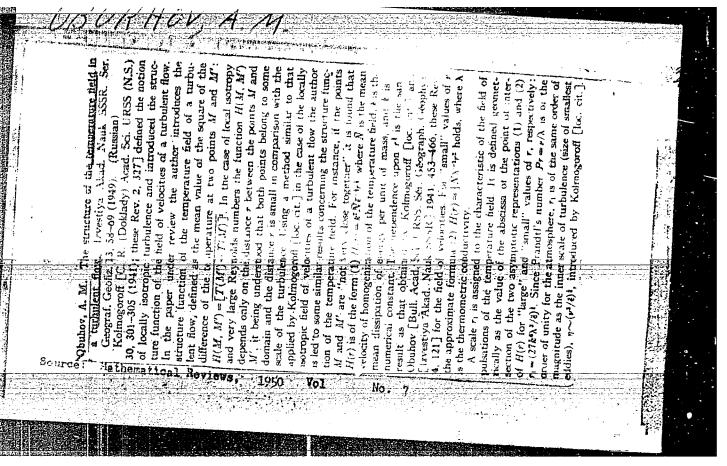
DURHON H-WI Miscorological Abst. 4B-140 Vol. 4 No. 2 Pob. 1953 Obukhov, A. H., Turbulantanet, v temperaturno acc atmosfere. Turbulence in an almosphere with inhomogeneou temperature. Akademiia Mauk, 885R, Institut Teoreticheskoi Bibliography on Turbulent Exchange Geofiziki, Trudy, 1:95-115, 1946. 3 figs., 3 tables, 6 ref., 38 eqs. Also: Akademiia Nauk, SSSR, Isvestiia, Ser. Geogr. i Geofiz., 13(1):58-69, 1949. DEG-Influence of vertical temperature inhomogeneity on evolution of turbulence in the atmosphere. This influence is quantitatively calculated by applying correction factors to Prandtl's semi-empirical theory; the universal Richardson's criteria being used. As a result it is possible to quantitatively evaluate the height of the dynamic turbulent layer under various conditions. (Same item as 1-98, Jan. 1950. 148.) Subject Headings: 1. Turbulence theory 2. Atmospheric turbulence. -- M.R.

OBUKHOV, A. M. Dr. Physicomath.Sci.

Dissertation: Application of Methods for Statistic Description of Continuous Sields to the Theory of Atmospheric Turbulence. Inst. of heoretical Geophysics, Acad. Sciences, USSR. 11 June, 1947.

SO: Vechernyaya Moskva. Jun., 1947 (Project #17836)





DOURHOU A-M

Obuhov, A. M. The pulsation of pressure in a turbulent 1008, Doklady Akad, Nauk SSSR (N.S.) 66, 17-20 (1949). (Russian)

In this paper the author presents a sufficiently general, the form method for the determination of the structure function of the pressure field in an isotropic turbulent flow of incompressible fluid. Under the assumption of statistical homogeneity and isotropy of the field of velocities and the pressure field, and under the further assumption that the fourth moments of the derivatives of the field of velocities have approximately the same relation to the second moments as in normal distributions [cf. Millionsciken, Batt sead. Sei. URSS, Ser. Geograph, Geophys, Elzvestia Akad 22 SSAR 1041, 433 446, these Rev. 4, 12

$$\Delta^{i}\Pi(\rho)=-\sigma^{i}\frac{\partial^{2}f)^{in}}{\partial\xi^{n}\partial\xi^{n}}\frac{\partial^{2}f)^{n}}{\partial\xi^{n}\partial\xi^{n}}$$

connecting the structure function of the pressure held $\gamma = (p/M_0) + p(\overline{M_1}))^{\frac{1}{2}}$ and the arriveness function of this word at velocities $\mathcal{D}^{ad}(\mathfrak{k}) \approx (\mathfrak{p}^a(M_1) - \mathfrak{p}^a(M_2)) \mathfrak{p}^a(M_3) \mathfrak{p}^a(M_4 + \mathfrak{p}^a(M_3))$ were p. The structure tensor for the lowally isotropic hold resolves (cf. Kolmogorod, C. R. Dokente, Arch Sci. a 5 (2) 5.7 30, 301-305 (1941) these Rev. 2, 327; has

$$D^{a\beta}(\xi) \approx D_{nn}(\rho)\delta^{a\beta} + \left(\frac{D_{nn} - D_{ii}}{\sigma^2}\right)\xi^a\xi^{\beta},$$

where D_{aa} and D_{B} are the longitudinal and the transversal structure functions of the field of velocities, p is the distance between the points M1 and M2, and s is the density of the medium. A particular case, $D_{ii} = b^i \rho^i$, $D_{nn} = \frac{1}{2} b^i \rho^i$ (b a constant) is considered. This leads to the relation $\Pi(\rho) \simeq \sigma^2 D_{11}^2(\rho)$ [ct. Kolmogoroff, loc. at.; C. R. (Doklady) Acad. Sci. URSS % 5 - 32 16 19 -19415 these Rev 3 221 Olimbox C R They are, Acad Services Nov. 32, 19-21 (1941). Bull. Acid Sci URSS Sér Géograph Géophys, [Izvestia Akad. Nauk SSSR 1941 454 466; these Rev 3, 221; 4, 121]. The author points or that the pulsation of pressure in a toribulent flow argues only a connected with the problem of if for a from between the rold of sound and the turbulence. however from the a oushcal point of view of a turbulent those and only the soundal serveture, but also the time some than a try was dues of pressure may be of interest

L. Leimanis (Vancouver, B. C.)

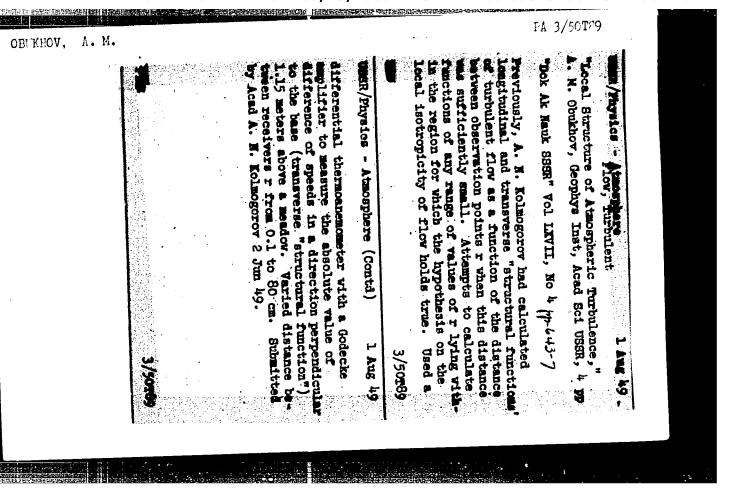
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CBUKHOV, A.M.

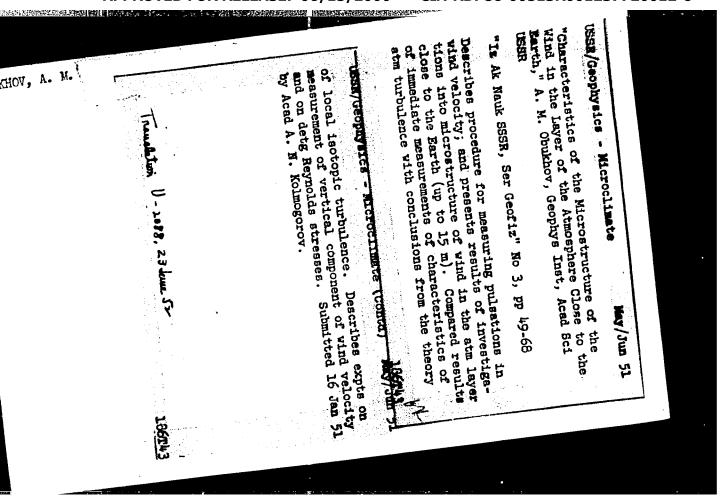
Turbulentnost'. (In: Mekhanika v SSSR az tridtsat' let, 1917-1947. Moskva, Gostekhizdat, 1950. p. 332-340)

Bibliography: p. 339-340. 28 references.

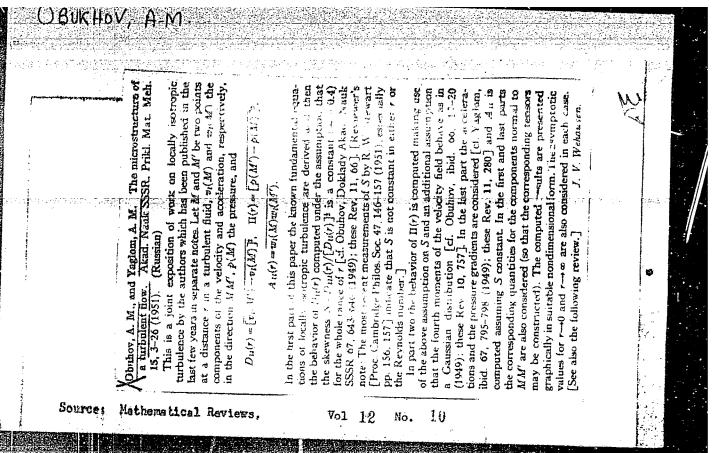
Title tr.: Purbulence.

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SO. Aeronautical Science and Aviation in the Soviet Union. Library of Congress. 1955.



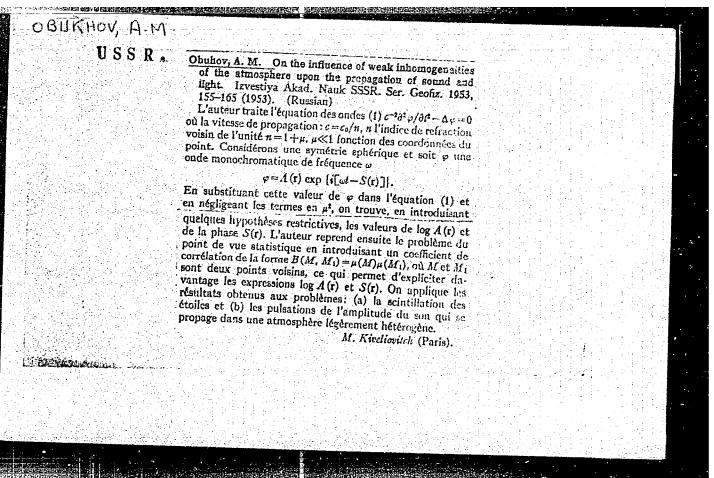
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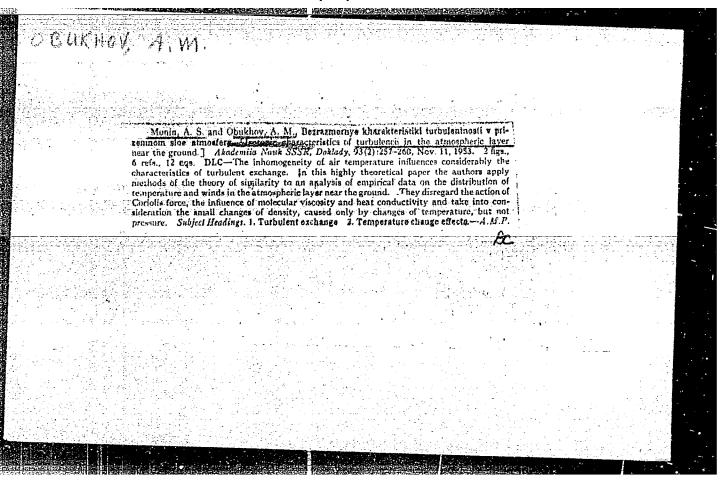


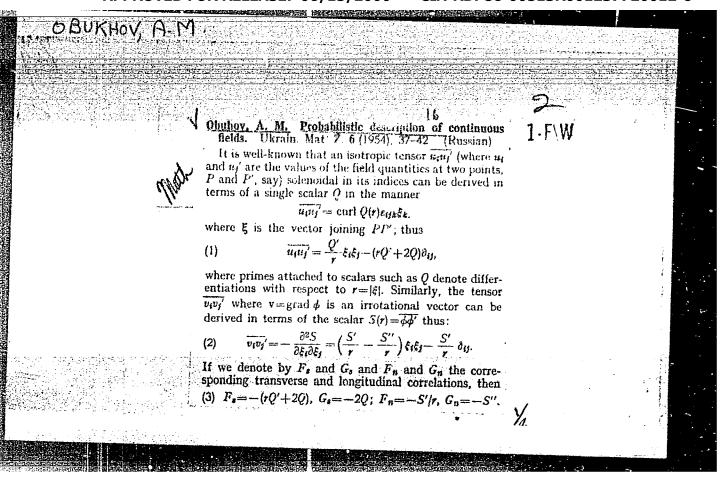
CBUKHOV, A.M.; PINUS, N.Z.; KRECHMER, S.N.

Results of experimental investigations of microturbulence in the free atmosphere. Trudy TSAO no.6:174-183 152. (NIRA 11:6)

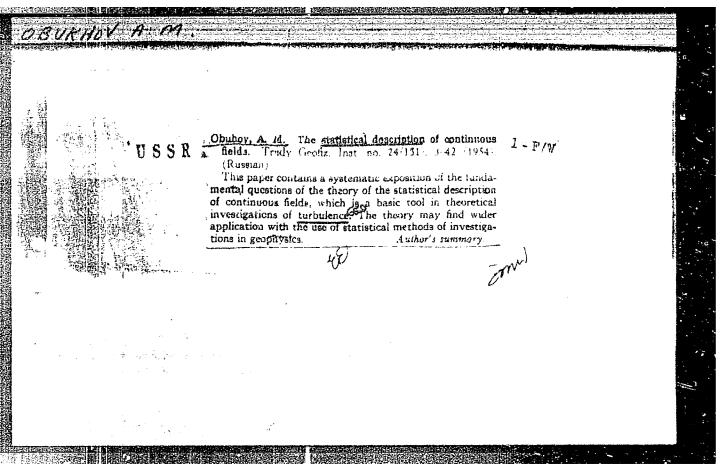
(Atmospheric turbulence) (Aeronautics in meteorology)

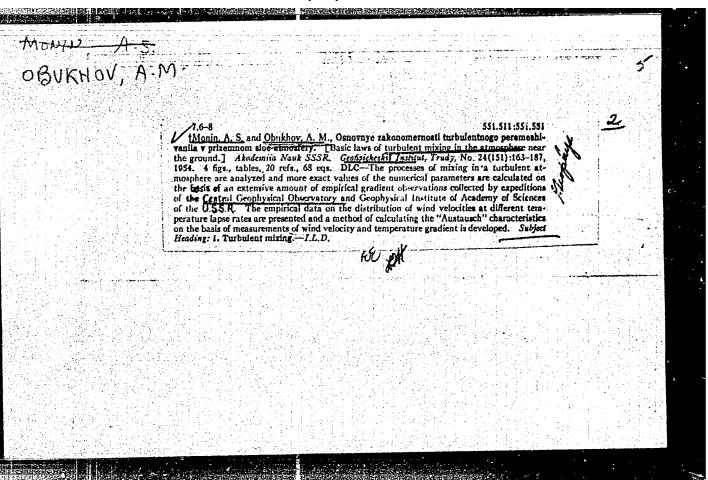






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| | Thus $G_s-2F_n=-2\int_{r}^{\infty}(F-G)\frac{d\rho}{\rho},$ $G_s+F_n=\int_{0}^{r}\rho^2(2F+G)d\rho.$ | |
| | $G_s + F_n = \int_0^r \rho^2 (2F + G) d\rho.$ | |
| | Some general comments on Kolmogoroff's similarity principles are also made. S. Chandrasekhar. | |
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FD-2576

OBUKHOV, A.M.

USSR/Geophysics - Meteorology

Card 1/1

Pub. 44 6/19

Author

: Obukhov, A. M.

Title

: Problem of evaluating the success of alternative forecasts

Periodical

: Izv. AN SSSR, Ser. geofiz, Jul-Aug 55, 339-349

Abstract

: The author gives a general analysis of the problem of searching for the most rational methods for evaluating the success of alternative forecasts and presents certain expeditious criteria governing the success of forecasting. Five references, e.g. N. A. Bagrov, "Problem of evaluating hydrometeorological forecasts,"

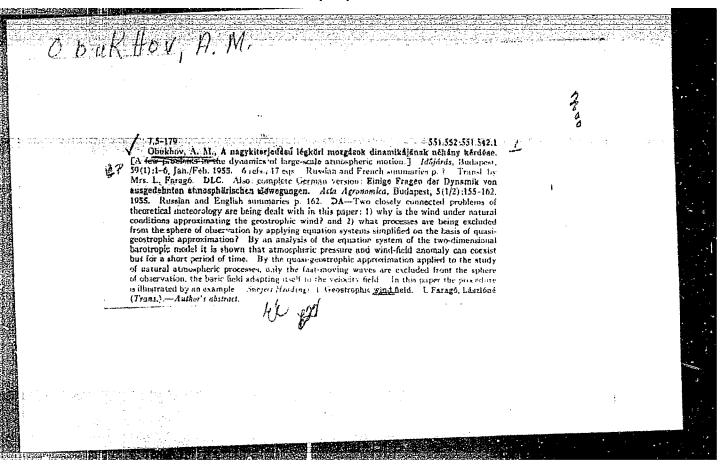
Meteorologiya i gidrologiya, No 6, 1953.

Institution

: Geophysics Institute, Academy of Sciences USSR

Submitted

: September 9, 1954



USSR/Geophysics - Meteorology meeting

DBUKHOV, A M.

FD-1711

Card 1/1

: Pub. 45-11/12

Author

Obukhov, A. M.

Title

: Chronicles. Conference of meteorologists in Budapest

Periodical

: Izv. AN SSSR, Ser. geofiz., 86, Jan-Feb 1955

Abstract

: From 4 to 10 October 1954, in Budapest, a conference of meteorologist was held on the initiative of the Academy of Sciences of Hungarian People's Republic, in participation with meteorologist from China, USSR, Germany, Czechoslovakia, Poland, Rumania, and Bulgaria. The principal theme of the conference was long-range weather forecasting. Brief communications were given on other problems of meteorology. Attending as representatives of the USSR were A. M. Obukhov, Corresponding Member of Academy of Sciences USSR, and N. A. Aristov, Candidate of Geographical Sciences, who reported on methods of long-range forecasting in use in the meteorological service of the USSR. Another very interesting report was on the influence of the Tibetan plateau on the circulation of the atmosphere in the northeastern part of China, by Prof. K'u Ch'eng-ch'ao. The German delegate, Prof. Phillips, indicated the importance of physicomathematical methods in forecasting. Prof. Kaptse-vich (Poland) reported on anemographs.

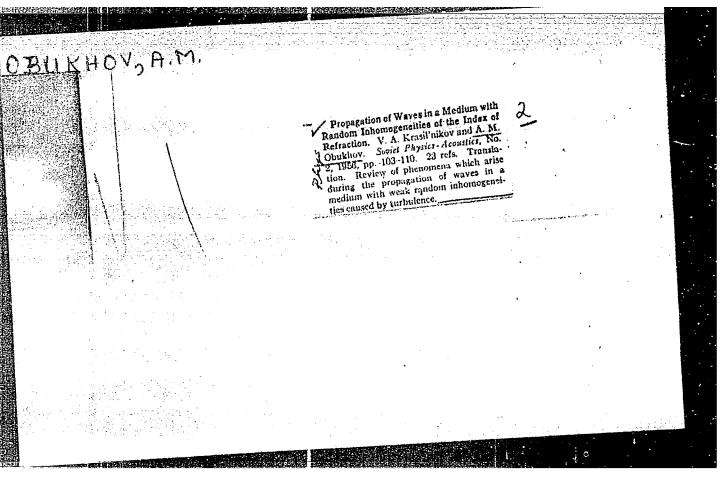
OBUKHOV, A. M. and KRASILNIKOV, V. A.

Physics Research Institute, Lomonosov State University, Moscow.

"On Wave Propagation in Media with Irregular Fluctuations of the Refractive Index" paper presented at 2nd International Congress on Acoustics, Cambridge, Mass., 17-23 June 1956.

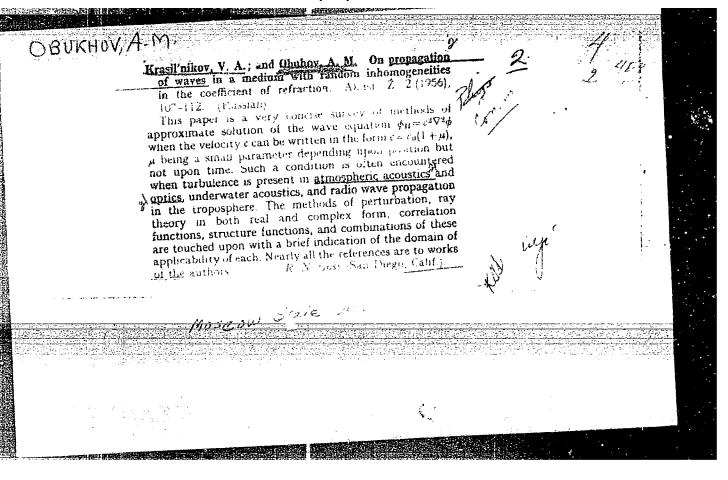
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OBUKHOV, A. M., YAGLOM, A. M.

"On Microstructure of Atmospheric Turbulence," paper submitted at International Assoc, of Meteorology Meetings, Toronto, Canada, 3-14 Sep 57

C-3,800,327

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OBUKHOV, A. M., and MONIN, A. S.,

"On Meteorological Questions, Especially Diffusion and Convection,"

paper presented at the XIth General Assembly of the Int'l. Union of Geodesy and Geophysics, Toronto, Canada, 3-14 Sept. 1957 (Izv. Ak Nauk SSSR - Ser. Geog. 1958, No. 2, pp 3-8 [USSR]).

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

Chukhed A.NI.

25-7-9/51

Obukhov, A.M., Member-Correspondent AN SSSR, Director of the In-AUTHOR:

stitute of Atmospheric Physics

The National Boundaries are no Obstacle for Scientific Relations TITLE:

(Dlya nauchnykh svyazey granitsy ne pomekha)

Nauka i Zhizn', 1957, # 7, p 5 (USSR)

The author of this letter says that the International Youth PERIODICAL: Festival coincides with the International Geophysical Year. ABSTRACT:

scientific research work performed simultaneously all over the globe will closely unite the scientists of the world, so that one could almost speak of a "Festival of Scientists". These facts show clearly that there are no serious disagreements among people of different nationalities which cannot be overcome. Frontiers and oceans are no obstacles for friendly relations.

The article contains one photo.

Library of Congress AVAILABLE:

Card 1/1

Church

AUTHOR: Obukhov, A.M.

49-9-4/13

TITLE:

On the accuracy of preliminary calculations of advective field changes in numerical weather forecasting. (O tochnosti predvychisleniya advektivnykh izmeneniy poley pri chislennom prognoze pogody).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1957, No.9, pp.1133-1141 (USSR)

ABSTRACT: Analysis of the possible sources of errors in calculating the baric field is a very complicated problem and the sources of errors can be arbitrarily divided into the following groups: errors due to utilising simplified "weather forecasting equations"; errors relating to the initial conditions affecting the accuracy of forecasting of the field by the particular calculation method; computing errors due to the substitution of differential equations by difference equations and also other computing errors. The author limits himself to investigating the nature of some of the errors caused by the substitution of the coordinate derivatives by appropriate finite differences on the example of a simple model in which the field changes have an advective character. For the difference equation Card 1/3a solution is derived in a general form and for a concrete

49-9-4/13

On the accuracy of preliminary calculations of advective field changes in numerical weather forecasting.

example of a "shifting front", the magnitude and the character of the respective errors are evaluated. The problem is also considered of the advisability of applying field smoothing in the calculations. In para.l the author deals with the selection of a model, focussing attention on elucidating the possibility of solving by electronic computers, using data for a fixed network in space of the simple forecasting problem which synoptics solve without difficulty by graphical methods. In para.2 an approximate description is given of the advection by means of the appropriate differential-difference equation, whilst in para.3 the calculation of advection using smoothing is carried out. It is concluded that solving of the elementary computing operation of the field transfer by computers involves certain difficulties but the arising errors can be reduced by improved computing schemes. limits himself to considering the unidimensional problem but it can be assumed that the fundamental qualitative conclusions will be valid also for a spatial lattice.

Card 2/3 There are 2 figures and 11 references, 8 of which are Slavic.

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OBURHOV, A.M.

In the high-alititude laboratory. Mauka i zhizn' [24] no.11:30-31
(MIRA 10:11)
[W] *57.

1. Chlen-korrespondent AM SSSR, direktor Instituta fiziki atmosfery.
(Artificial satellites)

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

OBUKHOV, AM.

AUTHOR: Obukhov, A. M.

49-11-9/12

TITLE:

Soviet work in the field of studying atmospheric

turbulence. (Sovetskiye Raboty v oblesti izucheniya

atmosfernoy turbulentnosti).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya,

1957, No.11, pp. 1389-1392 (USSR)

ABSTRACT: Brief review of Soviet pre-war and post-war work, dealing only with the main trends in this complex field.

Largely the author restricts himself to briefly

outlining the subject matter and mentioning the names of the respective teams. No bibliography is given; however, the author states that a full bibliography is contained in his article "Turbulence" published in the symposium "Mechanics during the last thirty years" in 1950.

ASSOCIATION: Ac. Sc. USSR, Institute of Physics of the Atmosphere. (Akademiya Nauk SSSR Institut Fiziki Atmosfery)

AVAIIABLE: Library of Congress.

Card 1/1

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

: OBUKHOV, A. M. Name

: Professor, Associate Member of USSR Academy of Sciences Title

: Professor Obukhov is the author of an article entitled "Exploration Outside the Atmosphere". The article mentions Remarks

the role of the sputnik in measuring the thickness of the atmosphere, electricity in the ionosphere, and the distribution of

clouds and earth currents around the globe.

Source

: P: Wissen und Leben (Leipzig), No. 12, 1957, Special Appendix,
"Der Erste Schritt in den Kosmos" (First Step into Space), p. 12

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

OBUKHOV, A. M.

"Description of Turbulence in the Terms of Lagrangian Variables."

papers submitted for Intl. Symposium on Atmospheric Diffusion and Air-Pollution (IUTAM) (IUGG) 24-29 Aug 58, Oxford, UK.

OBUKHOV A. M.

3(7) P. 2 PHASE I BOOK EXPLOITATION SOV/1837

Akademiya nauk SSSR. Institut fiziki atmosfery

Raboty po dinamicheskoy meteorologii (Works on Dynamic Meteorology)
Moscow, Izd-vo AN SSSR, 1958. 186 p. (Series: Its: Trudy, vyp. 2)
1,500 copies printed.

Resp. Ed.: I.A. Kibel', Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: K.P. Gurov.

PURFOSE: The issue of the Institutes' Trudy [Transactions] is intended for scientists and research workers engaged in weather forecasting and climatology.

COVERAGE: This collection of articles represents the results of 12 studies in dynamic meteorology, carried out from 1951 through 1954. They treat weather forecasting techniques using the methods of dynamic meteorology as well as general theoretical questions in the study of climate. All authors,

Card 1/4 5

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

OBUKHOV, Alexander NName

Associate Member of USSR Academy of Sciences

Title :

Obukhov, in his article, "The World's Weather", points out how the man-made satellite will open up broader possibilities for the study of the upper reaches of the Remarks: atmosphere, and of its lower regions where weather is made; this, in turn, will be of great value in long-range

weather forecasts.

Source : P. USSR (Soviet publication, Washington, D.C.), No.1(16), January 1958, pp. 11-12

83792

s/124/60/000/008/009/011 A005/A001

Translation from: Referativnyy zhurnal, Mekhanika, 1960, No. 8, p. 94, # 10405 3.5000

Obukhov, A. M., Chaplygina, A. S. AUTHORS:

The Variation of the Baric Field in the Medial Troposphere

TITLE: PERIODICAL: Tr. In-ta fiz. atmosf. AN SSSR, 1958, No. 2, pp. 23-49

The work was performed in 1951-1952. The theoretical and empirical investigation of the variability of the baric field in the medial troposphere is described. The authors follow Ye. N. Blinova (1943), A. M. Obukhov (1949), and I. A. Kibel' (1950) and use the vorticity transfer equation (besides the heat supply equation) as the basic forecast equation. The solution of these equations is given in a form differing somewhat from that adopted in latter works. Thus the unknown functions 3p/3t and w (where p is the pressure, w is

This makes it possible to obtain linear differential equations for \hat{H} and \mathbf{w}_1 with

Card 1/4

83792

S/124/60/000/008/009/01: A005/A001

The Variation of the Baric Field in the Medial Troposphere

practically constant coefficients, when $\zeta = \ln (p/p)$ is an independent variable Furthermore, replacing $\Delta \partial \ln p / \partial t$ by $-k^2 \partial \ln p / \partial t$ (where k is determined by the scale of isallobaric source regions), the problem is reduced to ordinary differential equations with the variable ζ (solution for one wave without allowance for dispersion). The solutionsfor H and w_1 are given in the form of integrals in ζ of the Green function multiplied by the vorticity advection and the temperature advection. Graphs of the Green functions are added (depending only on the altitude). The presented formulae cannot be used immediately for forecasting, but they yield some qualitative conclusions. These concern the estimation of the vertical spread of the influence regions, the ratio of the weights of the individual levels, the dependence of these weights on the disturcance scale and on the stratification, the dependence of the signs of H and w_1 on the distribution of the vorticity advection and the temperature advection, and others. A statistical estimation of the disturbance scale in the isallobaric field at various levels is given for choosing the coefficient k. The correlation coefficients and the regression equations between the variations of H and Δ H in time are presented (hereat the Laplace operator was determined by finite differences with 800 km spacing). In the following division, the authors expound

Card 2/4

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The Variation of the Baric Field in the Medial Troposphere

the results of a statistical investigation of the connection between the actual variations in pressure and "affecting factors" indicated by the theory - the vorticity advection and the temperature advection at various levels. For determining these connections, the variations in pressure observed are correlated (in the diagnostic plan) with the magnitudes of vorticity and temperature transfer for the same period. The regression equations, the correlation coefficients, and other data are presented. Some qualitative conclusions are drawn. Thus it is noticed that the variation in pressure at the various levels is mostly connected with the vorticity advection at the 700 mb level and with the advection OT 500/1,000. The existence of a "compensation level" (at 700 mb altitude) is cleared up, where the influence of the thermal factor is minimized. The last division of the work deals with the specification of the graphic method proposed by N. I. Buleyev for forecasting the charts AT 700. First of all, it is statistically established that the second term of the forecast formula of N. I. Buleyev $\delta H_{700} = a(H, \Delta H)_{700} + b(T, \Delta T)_{700}$ has lower weight than the first term. The proposed specifications of the graphic method of N. I. Buleyev tend along 2 directions: a) the choice of the optimum method of averaging when

Card 3/4

83792

\$/124/60/000/008/009/011 A005/A001

The Variation of the Baric Field in the Medial Troposphere

plotting the quasistationary B field, and b) the forecast of the evolution of this field. It is proposed to average accordingly to points located at two concentric circles, whereat the weights for these two groups of points are chosen from the condition of least interdiurnal variations of B. For forecasting the evolution of B, a semiempiric formula is proposed, according to which these variations are caused, on the one hand, by the inertia of the variations of B for the preceding 24 hours, and on the other hand, by the tendency of B to the climatic norm. The weights of these two factors (the tendency of B for the preceding 24 hours and the deviations of B from the climatic norm) are determined in statistical way. A formula for forecasting climatic norm) are determined in statistical way. A formula for forecasting to the proposed specified graphic procedure is described. Comparative data on the successfulness of forecasts with and without the proposed specific ations are presented.

Translator's note: This is the full translation of the original Flastian abstract.

Card 4/4

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

15(6)

Obukhov. A. M., Corresponding Member, AUTHOR:

SOV/30-53-**-20/48

AS USSR

TITLE:

News in Brief (Kratkiye soobshcheniya) Symposium on the Research of Atmospheric Diffusion and Air Pollation

(Simpozium po izucheniyu atmosfernoy diffuzii i

zagryazneniy vozdukha)

PERIODICAL:

Vestnik Akademii nauk SSSR, 1958, Nr 11,

pp 86 - 87 (USSR)

ABSTRACT:

The symposium was held in Oxford (England) from

August 24, to 29. It was organized by the International

Union of Theoretical and Applied Mechanics, and the International Union of Geodesy and Geophysics.

105 scientists (experts in the fields of aero-

mechanics and meteorology) participated in the meeting.

A total of 42 reports were given. The Soviet delegate A.S.Monin reported on the theory of turbulent

diffusion. After the end of the symposium a number

of scientific institutes were visited. The British scientists expressed their desire to increase scientific

Card 1/2

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

| • | |
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| News in Brief. Symposium on the Research of Atmospheric Diffusion and Air Pollution | sc7/35-51-11-20/48 |
| contacts with the Soviet Union. | |
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| Card 2/2 | |
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SOV/ 49-58-11-9/18

AUTHORS: Monin, A. S. and Obukhov, A. M.

TITLE: Small Amplitude Atmospheric Variations and Adaptation of Meteorological

Fields (Malyye kolebaniya atmosfery i adaptatsiya

meteorologicheskikh poley)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya,

1958, Nr 11, pp 1360-1373 (USSÉ)

ABSTRACT: The movements of the air masses can be classified as

slow (synoptic) and fast (waves). The fast processes having a small amplitude possess a character of short waves. Therefore, in order to determine the static and geostrophic properties, a problem of short waves in the atmosphere should be solved. The fast movements originate when an equilibrium of static and geostrophic conditions are disturbed. The waves are produced which spread into the surrounding air masses causing them to adjust their meteorological fields. Therefore, in order to establish the general equilibrium of the air masses, these short waves of the fast motion should be determined (filtered

off). In order to describe the short waves

 $\Lambda \frac{\delta \phi}{\delta +} = -\ell \Delta \phi$ is obtained. From the last three

Card 1/5

Small Amplitude Atmospheri: Variations and Adaptation of Meteorological Fields

equations of (5) the final expressions (9) are derived in the form most suitable for further analysis when (10) are included together with the condition (11). The equations (9) are applied in the solutions (12), therefore, the parameters of geostrophic wind (13) can be included. The solutions of (9) will be stable only if (14) to (16) are satisfied. If the initial parameters (10) are not related to (14), then the solutions (9) can be shown as a sum of the stable condition, i.e. function \$\psi\$ and the unstable condition given by (17). Therefore, this can be solved by means of the equation (19) and the matrix (20) when the equation (18) is introduced. The final solution can be shown as (21), (22) and (23). The invariant (23) represents the potential eddy (Refs 1 and 4). It should be noted that from the third and fifth equations of (9) the equation:

$$\frac{\delta}{\delta t}$$
 (p - c²e) = -\beta\chi

is obtained which can be transformed into an invariant (24) Card 2/5

Small Amplitude Atmospheric Variations and Adaptation of Meteorological Fields

when χ and z=0 (according to (11)). Solutions (9) in which $J_1\equiv J_2\equiv 0$ are called waving solutions. By an application of the formula (12) J_1 and J_2 can be expressed by ψ_s forming (25) and (26). Then, the function ψ_s can be solved from the derivation (27) and the invariant obtained is an internal form of the potential eddy. Excluding the expression

 $Q = -\frac{1}{g}$ $\frac{p}{3z}$ from (27), the expression (28) can be obtained (Ref 4) where α^2 has the value of (29). Also from the invariant (27) the equation (30) for the function ψ can be found (Ref 4). From the solution ψ_s the term defining the waving solution can be separated, assuming that the expression of potential eddy (27) is equal to zero. Then, the coefficients of the Eq.(15) do not depend on x, y, t. These equations have partial solutions (31) shown as harmonic waves with amplitudes related to z. Substituting (31) into (15) the equations (32) for the amplitudes Φ (z) and X(z) are obtained. If the frequency is shown as (33), then

Card 3/5

Small Amplitude Atmospheric Variations and Adeptation of Meteorological Fields

the expression of takes the form (34). This motion does not show a vertical waving (Refs.1 and 4). Therefore, another dimensional solution should be found. This can be done when the height of the atmosphere

H = \bar{p} /g \bar{e} is introduced into the functions Φ and λ , Then, they will be described by the expressions (35), (36) and (38). The frequencies related to (35) satisfy the function (37), but for practical reasons the Eq.(36) can be transformed in order to obtain (39) and (40). Waves can also be found with frequencies (41) in case of $\kappa \to \infty$, which is typical for the internal gravitational waves. Another kind of waves (42) when $\kappa \to 1$ can be found in isothermic conditions of the atmosphere. This type of waves represent the acoustic waving. The frequencies can be calculated as (43) or (44) according to the type: acoustic or gravitational respectively. Generally, it can be stated that the short waves, which are produced in the atmosphere, can be divided into three main categories: bidimensional, internal acoustic

Card 4/5

Small Amplitude Atmospheric Variations and Adaptation of Meteorological Fields

and internal gravitational.
There are 8 references, 6 of which are Soviet, 1 English, 1 German.

ASSOCIATION: Akademiya Nauk ESSR, Institut fiziki atmosfery (Institute of Physics of the Atmosphere, Ac.Sc., USSR)

SUBMITTED: April 10, 1958

Card 5/5

CIA-RDP86-00513R001237720012-6 "APPROVED FOR RELEASE: 06/15/2000

SOV/20-122-1-15/44

Monin, A. S., Obukhov, A. M., Corresponding Member, 3(7) . AUTHORS:

Academy of Sciences, USSR

CONTROL OF THE PROPERTY OF THE

The Main Types of the Motions of a Baroclinic Atmosphere in TITLE:

the Field of the Coriolis Power (Osnovnyye tipy dvizheniy

baroklinnoy atmosfery v pole sily Koriolisa)

Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 1, pp 58-61 PERIODICAL:

(USSR)

This paper gives a classification of the main types of the ABSTRACT:

dynamic processes in the atmosphere (horizontal vortex motions, gravitation waves and acoustic waves) on the basis of the solution of the problem of the small vibrations of a baroclinic atmosphere for sufficiently general assumptions. In this way, the filtering activity of the quasistatic approximation may be explained. The authors first give the system of the equations for the dynamics of the atmosphere. The state of relative rest is chosen as the "main state" of the atmosphere. Some quantities for the characterization of the excited state of the atmosphere are then defined.

Linearizing the equations of the atmosphere dynamics (i.e.

Card 1/4

SOV/20-122-1-15/44

The Main Types of the Motions of a Baroclinic Atmosphere in the Field of the Coriolis Power

国的政治的国际国际政治的政治规则,这个区众的现代和治疗证明的对抗,并不是否定义的对抗。

by eliminating the square terms), a new system of equations is deduced. This system (like the initial system) is of the fifth order with respect to time, and it describes approximately the evolution of the perturbations. The boundary conditions for the coordinate z are then given. For the solution of the Cauchy (Koshi) problem, 5 initial conditions are necessary. The above-mentioned system of equations has a family of steady solutions which depends on one arbitrary function $\psi_{c}(x,y,z)$ of the coordinates. These steady-state solutions are horizontal and have no divergences; the formulae of the geostrophic wind and the equations of statics may be applied to them. The above-mentioned system of equations has an invariant - a function which may be linearly expressed by the initial characteristics of the field. The order of the system and the number of the independent characteristics of the field may be diminished by 2. The wave solutions are scattered "without leaving a trace". (If the characteristics of the wave field in the initial instant of time are different from zero within a certain finite region, they will approach zero

Card 2/4

sov/20-122-1-15/44

The Main Types of the Motions of a Baroclinic Atmosphere in the Field of the Coriolis Power

for t $\rightarrow \infty$. The initial field may be given as a sum of a steady component and of a wave component. The authors then assume that the initial characteristics of the field satisfy certain conditions (which are given in this paper) everywhere, with exception of a finite region. The various characteristics may be given independently. In the course of time, the disturbing wave is scattered and the characteristics of the field approach the steady-state type in any finite region. This is the adaption process of the fields in the atmosphere. For an isothermal atmosphere, the solution may be found as a superposition of the corresponding partial solutions of the corresponding differential equation. The waves of higher frequencies are called acoustic waves, the waves of lower frequencies - gravitation waves. The adaption of the atmosphere to the quasistatic state takes some minutes. There are 5 references, 4 of which are Soviet.

Card 3/4 3

OBUKHOU, A.M

PHASE I BOOK EXPLOITATION

sov/4867

Soveshchaniye po issledovaniyu mertsaniya zvezd, Moscow, 1958

Trudy Soveshchaniya po issledovaniyu mertsaniya zvezd, Moskva, 18-20 iyunya 1958 g. (Conference on the Study of Star Scintillation) Moscow, Izd-vo AN SSSR, 1959. Errata slip inserted. 1,000 copies printed.

Editorial Board: A. M. Obukhov, Corresponding Member, Academy of Sciences USSR;
Resp. Ed.: O. A. Mel'nikov, Professor; I. G. Kolchinskiy, Candidate of Physical
and Mathematical Sciences; N. I. Kucherov, Candidate of Physical and Mathematical
cal Sciences; Secretaries of the Editorial Board: N. V. Bystrova, Candidate of
Physical and Mathematical Sciences; M. A. Kallistratova and L. N. Zhukova; Tech.
Ed.: M. E. Zendel:

PURPOSE: This book is intended for astronomers. It may be of interest to physicists studying the atmosphere and designers of astronomical equipment.

COVERAGE: The book reports on the Transactions of the Conference on the Study of Stellar Scintillation, held in Moscow from 18 to 25 June 1958. The Conference was organized by the Astronomical Council AS USSR and the Institute of Physics of the Atmosphere AS USSR. The book contains summaries of 25 reports read at the

card 1/2

Stellar Scintillation

5

Tatarskiy, V. I. [Institute of Physics of the Atmosphere AS USSR].

Interpreting the Observations of the Scintillation of Stars

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012
Bovsheverov, V. M., A. S. Gurvich, V. I. Tatarskiy, and L. R. Tsvang

[Institute of Physics of the Atmosphere AS USSR]. Instruments for the

card=2/9

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

| Conference on the Study (Cont.) | sov /4867 |
|--|------------------|
| Obukhov, M. A. | 61 |
| Mel'nikov, O. A. | 61 |
| MORNING SESSION, June 1 | 19th |
| Reports: | |
| Mel'nikov, O. A., I. G. Kolchinskiy, and N. I. Kuche and Flickering of Star Images. Astroclimate. (Revi Works) | |
| Zhukova, L. N. [Glavnaya astronomicheskaya observations of tion Made at Pulkovo With the ASI-5 Telescope | |
| Demidova, A. N. [Main Astronomical Observatory AS of Stellar Scintillation Made at Pulkovo With the A | |
| Card 4/9 | |

OBUKHOV, A. M.

"The Influence of Buoyancy on the Fine Structure of Turbulence,"

report presented at the Intl. Symposium on Fluid Mechanics in the Ionosphere, Ithaca, New York, 9-15 Jul 1959.

Inst. Physics of the Atmosphere, I Moscow

"APPROVED FOR RELEASE: 06/15/2000

CIA-RDP86-00513R001237720012-6

3.5150 3.5140

\$/035/61/000/009/017/036 A001/A101

AUTHOR:

Obukhov, A. M.

TITLE:

On theoretical studies of the stellar scintillation problem

PERIODICAL:

Referativnyy zhurnal. Astronomiya i Geodeziya, no. 9, 1961,32, abstract 9A248 ("Tr. Soveshchaniya po issled. mertsaniya zvezd",

1958. Moscow-Leningrad, AN SSSR, 1959, 5-7. Discuss., 60-62)

The author analyzes the state of the problem of theoretical studies TEXT: of star scintillations. He notes that considerable successes have been achieved, in particular, in studying the dependence of brightness fluctuations and tremor amplitude on the zenith distance of the star and characteristics of atmospheric turbulence, in calculating the temporary spectrum of fluctuation of brightness and incidence angle, as well as in estimating the influence of the optical system on results of measuring various characteristics of star scintillation phenomenon observed with telescopes. The author briefly reviews the works by J. van Isacker, L. A. Chernov, V. I. Tatarskiy and others on the theory of star scintillation. L. Zhukova, I. Aslanov

[Abstracter's note: Complete translation]

Card 1/1

VB.

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237720012-6

24(8), 10(7)
AUTHOR:
Obukhov, A.M., Corresponding Member, SOV/20-125-6-19/61

TITLE:
On the Influence Exercised by the Archimedean Forces on the Structure of the Temperature Field in a Turbulent Flow (0 vliyanii arkhimedovykh sil na strukturu temperaturnogo polya v turbulentnom potoke)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6, pp 1246-1248 (USSR)

In 3 earlier papers dealing with the theoretical analysis of the problem of the microstructure of the temperature field in a turbulent flow the temperature pulsations are assumed to be so small that the influence exercised by Archimedean forces upon the dynamics of the flow may be neglected. With other words, the heat transferred by the turbulent flow is considered to be a passive admixture. The present paper deals with the determination of the limits of applicability of this hypothesis on the basis of the qualitative investigation of the influence of Archimedean forces by the methods of the theory of the number of dimensions. The pulsations T₁ = T - T₀ are assumed

Card 1/4

ABSTRACT:

On the Influence Exercised by the Archimedean Forces on the Structure of the Temperature Field in a Turbulent Flow

sov/20-125-6-19/61

to be small as against a certain average temperature T_o of the medium, but the Archimedean forces are nevertheless taken into account. The condition $|T_1|/T_o$ is satisfied with sufficient accuracy for the layer located near the surface of the earth and makes it possible to describe the motion of a medium that is inhomogeneous with respect to temperature by using the approximation equations of the convection theory

approximation equations of the distance of
$$\frac{du}{dt} = -\frac{1}{9} \frac{\partial p_4}{\partial x} + \nu \Delta u$$
, $\frac{dv}{dt} = -\frac{1}{9} \frac{\partial p_4}{\partial y} + \nu \Delta v$, $\frac{dw}{dt} = -\frac{1}{9} \frac{\partial p_4}{\partial z} + \nu \Delta v + \beta T_1$,

 $\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0$, $\frac{dT_1}{dt} = X\Delta T_1$. Here u,v,w denote the velocity components of the flow; p_1 - the deviation of pressure from the standard; $T_1 = T - T_0$ - the deviation of temperature from normal; f_0 - the standard value of medium density; f_0 and f_0 the kinematic viscosity and the temperature conductivity of the

Card 2/4

SOV/20-125-6-19/61

On the Influence Exercised by the Archimedean Forces on the Structure of the Temperature Field in a Turbulent Flow

medium; $\beta = g/T_0$ denotes the "buoyancy parameter", which enters as a factor into the expression for the Archimedean force. The turbulence developing under the action of the Archimedean forces cannot be considered to be locally isotropic in the usual sense. The author therefore investigates, as the fundamental statistical characteristic of the temperaturepulsation field, the structural function $H(r;z) = [T(M')-T(M)]^2$ in the horizontal plane. The author confined his activities to investigating the structural function H(r;z) for an arbitrarily fixed value of z within the range of the "average dimensions" $l_1 \ll r \ll z$, where $l_1 \sim \sqrt{\kappa^3/\epsilon}$ denotes the internal dimensions of the turbulence (in the atmosphere of the order of magnitude of 1 cm). In turbulent disturbances of medium dimensions the direct influence exercised by viscosity and thermal conductivity may be neglected, and the only dimension parameter of the system initially written down is the parameter B. If the local structure of the temperature field is looked upon as external parameters (determining the statistical

Card 3/4

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On the Influence Exercised by the Archimedean Forces on the Structure of the Temperature Field in a Turbulent Flow

SOV/20-125-6-19/61

behavior of the pulsations), it is advisable to assume a dissipation of the energy and a "temperature dissipation" N.

It holds that $N = \chi(\text{gradT})^2$. In the case of sufficiently small distances, the influence exercised by the Archimedean forces is insignificant. In conclusion there follows an estimation of the minimum extent of the inhomogeneities above which the influence exercised by the Archimedean forces begins to be of importance. The estimation is carried out on the assumption of real conditions in the atmospheric layer near the surface of the earth. There are 10 references, 8 of which are Soviet.

ASSOCIATION:

Institut fiziki atmosfery Akademii nauk SSSR (Institute for the Physics of the Atmosphere of the Academy of Sciences)

SUBMITTED:

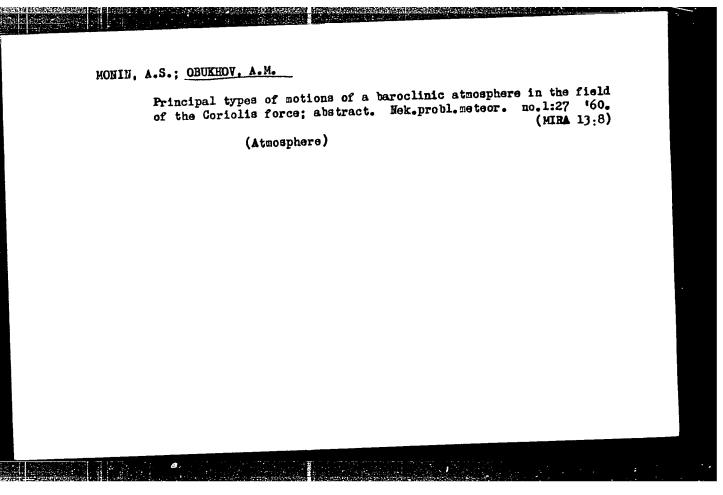
February 16, 1959

Card 4/4

OBUKHOV, A. M. (Moscow)

"On the Microstructure of Temperature-and Velocity Fields in Free-Convection Flows."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.



S/049/60/000/03/008/019 E131/E691

AUTHOR:

Obukhov, A.K.

TITLE:

Statistically Orthogonal Expansion of Empirical Functions

PERIODICAL: Isveetiya Akademii nauk SSSR, Seriya geofisicheskaya, 1960, Nr 5,

pp 432-439 (USSR)

ABSTRACT:

A method of statistical analysis of empirical functions, based on "natural" orthogonal expansions, is given. The method is illustrated on theoretical examples and on daily variations of the barometric pressure field, as a function of the height above the earth. In many cases a two-parameter model is found to be sufficient to describe pressure variations in a real atmosphere. There are 1 figure, 2 tables and 7 Soviet references.

ASSOCIATION Aindeniya mank SSSR, institut fisiki atmosfery (Academy of Sciences USSR

Institute of Physics of the Atmosphere)

SUMMITTED: August 21, 1959

Card 1/1

AVSYUK, G.A.; ECCONOLOV, G.V.; DOLGUSHIN, L.D.; ZERKOVICH, V.P.; MESHCHERYAKOV, Yu.A.; ORUKHOV, A.M.

Problems of physical geography at the 12th General Assembly of the International Union of Geodesy and Geophysics. Izv. AN SSSR. Ser. (MIRA 13:10) geog. no.6:126-130 N-D 160. (Physical geography)

OBURHOV, A.M.

Structure of the temperature and velocity field under conditions of free convection. Isv.AN SSSR.Ser.geofiz. no.9:1392-1396 S 160. (MIRA 13:9)

1. Akademiya nauk SSSR, Institut fiziki atmosfery.
(Atmospheric temperature)

OBUKHOV, A. M.

"Some Specific Features of Atmospheric Turbulence."

Presented at the International Symposium on Fundamental Problems in Turbulence and Their Relation to Geophysics, Marseille, France, Sept. 4-9, 1961

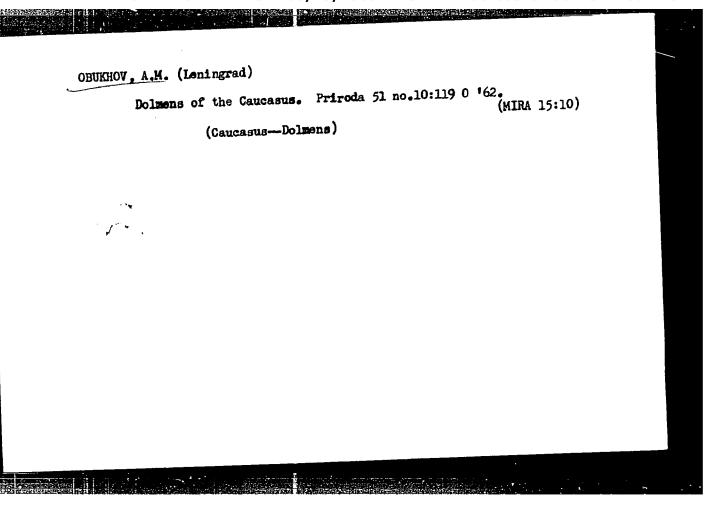
OBURHOV, Aleksandr Hikhaylovich

Prognoses of forecasts. Nauka i zhizn' 29 no.7:77-78 Jl '62.

(MIRA 16:6)

1. Direktor Instituta fiziki atmosfery AN SSSR. Chlen-korrespondent
AN SSSR.

(Weather forecasting)



OBUKHOV, A.M.

Dynamics of a stratified fluid. Dokl.AN SSSR 145 no.6:1239-1242 Ag 162. (MIRA 15:8)

l. Institut fiziki atmosfery AN SSSR. Chlen-korrespondent AN SSSR. (Hydrodynamics)

OBUKHOV, A.M.

Adiabatic invariants of atmospheric processes. Meteor.i (MIRA 17:5)

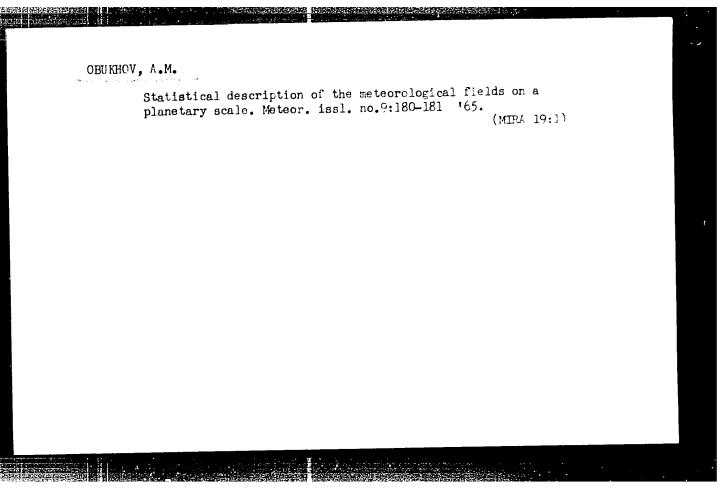
1. Chlen-korrespondent AM SSSR. Institut fiziki atmosfery AN SSSR.

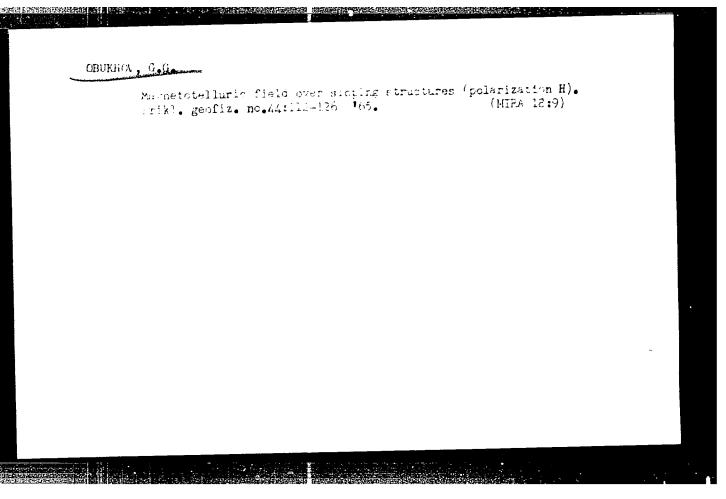
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